

**ABSTRACT**

Molecular scale electronic devices are disclosed. Such devices include at least two conductive contacts, and a conductive path bridging the contacts. The conductive path is able to be written into a perturbed state by a voltage pulse, which can be of high or low 5 conductivity, relative to an initial state. The conductive path comprises organic molecules including at least one electron-withdrawing group. Room temperature negative differential resistance is exhibited by the devices.